

administrating means for administering the at least one routing domain using a link state routing protocol;

at least one routing controlling device coupled to at least one network node of a routing area and part of a link state routing process for the routing areas to which the at least one network node belongs,

a link state database maintained by the routing controlling device for computing an optimal transmission path between network nodes in the at least one routing domain;

means for rejecting non-routing information and traffic presented at the at least one routing controlling device; and

means for injecting routing information from the at least one routing controlling device into the link state routing process, for generating, at each of the network nodes that are part of the link state routing process, link state databases that are identical to the link state database maintained by the at least one routing controlling device.

25. The arrangement according to claim 24, wherein there exists a routing controlling device for each routing area.

26. The arrangement according to claim 24, wherein the at least one routing controlling device belongs to more than one routing area.

27. The arrangement according to claim 24, wherein a routing domain comprises more than one routing area.

28. The arrangement according to claim 24, wherein the means for injecting routing information injects link state database records of a respective link state routing process into the link state processes of all of the routing areas to which the at least one routing control device belongs.

29. The arrangement according to claim 24, wherein a routing controlling device is connected to only one network node of the routing areas to which the routing control device belongs.

30. The arrangement according to claim 24, wherein a routing controlling device is connected to more than one network node of the routing areas to which the routing control device belongs.

31. The arrangement according to claim 24, wherein the at least one routing controlling device monitors and manages updates and changes in the network nodes of the routing areas to which the at least one routing control device belongs.

32. The arrangement according to claim 24, wherein a routing controlling device simulates the network nodes of the routing areas to which the routing control device belongs when injecting messages into a routing process when a link change occurs, such that the messages appear to be issued by a network node for purposes of fulfilling a used protocol and such that the messages are accepted by the network nodes.

33. The arrangement according to claim 24, wherein the communications network is the Internet.

34. The arrangement according to claim 33, wherein at least one of the network nodes is a router.

35. The arrangement according to claim 34, wherein the link state routing protocol is Open Shortest Path First.

36. The arrangement according to claim 33, wherein the administrating means is an Internet Service Provider.

37. The arrangement according to claim 33, wherein the link state routing protocol comprises a link state update protocol and a link state acknowledgment protocol for ensuring that all network nodes within a routing area have the same link state database, that the network nodes send Link State Acknowledgments (LSA) to each other, and that the network nodes employ an algorithm to determine a shortest path through the network for transmitting packets and messages.

38. The arrangement according to claim 37, wherein the at least one routing controlling device transforms a network change within a corresponding routing area into LSA records by manipulating LSA records in the link state database, the manipulated LSA records then being flooded throughout the respective routing areas.

39. The arrangement according to claim 24, wherein the communications network is an ATM network, the network nodes include switches, and the link state protocol is a Private Network to Network Interface.

40. A routing controlling device for controlling routing within at least one routing area of a routing domain and being part of a link state routing process, the at least one routing area having a plurality of network nodes intercommunicating using transmission links, each network node having a link state database which is the same for all network nodes within the routing area, the routing controlling device comprising:

a link state database which is identical to each link state database of the network nodes;

means for preventing non-routing information from being transmitted to the routing controlling device; and

means for injecting routing information into the link state routing process;

wherein the routing device only processes routing information and is connected to at least one network node within the routing area.

41. The device according to claim 40, wherein the routing controlling device controls the routing in a plurality of routing areas and includes a link state database corresponding to each of the routing areas.

42. The device according to claim 40, wherein the means for injecting routing information injects transformed link state database records into the link state routing process of the routing area.

43. The device according to claim 42, wherein the device simulates the network nodes of the corresponding routing areas by injecting messages and database records when there exists a change on a transmission link such that the messages appear to be issued by a network node connected to the transmission link.

44. The device according to claim 40, wherein the device monitors and manages updates and changes in the network nodes.

45. A method of controlling routing in at least one routing area of a routing domain, the at least one routing area having a plurality of network nodes, the method comprising the steps of:

- implementing a link state routing process in the at least one routing area;
- providing a routing controlling device for the at least one routing area that only processes information messages relating to routing;
- providing a link state database in the routing controlling device identical to a link state database in each of the network nodes of the at least one routing area, such that the device forms part of the routing process;
- providing information to the routing controlling device relating to updates and changes within the at least one routing area;
- transforming updated and new information into Link State Acknowledgments (LSA) records in the routing controlling device;
- sending the LSA records to the network nodes within the at least one routing area from the routing controlling device; and

flooding the updated and new information into the at least one routing area and updating the link state databases based upon the LSA records.

46. The method of claim 45, further comprising the steps of:
- controlling a plurality of routing areas from a routing controlling device;
 - maintaining a link state database for each of the corresponding routing areas in the routing controlling device; and
 - providing the network nodes of a first routing area with the updated information of at least one other routing area by sending LSA records of at least one other routing area to the network nodes of the first routing area.--

IN THE ABSTRACT

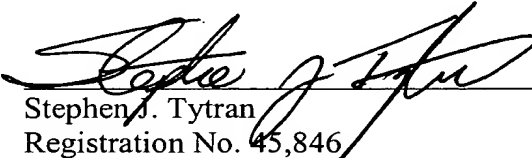
Please delete the Abstract on page 24 of the application and replace it with the New Abstract attached as a separate sheet.

REMARKS

The specification and claims have been amended and the Abstract has been replaced to place the application in better form for examination. Favorable consideration is respectfully solicited.

Respectfully submitted,

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Dated: September 14, 2000

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